



Nutrition & Children with Special Needs

By Dana Cox, RN, MA



<http://ECEZero2Three.com>

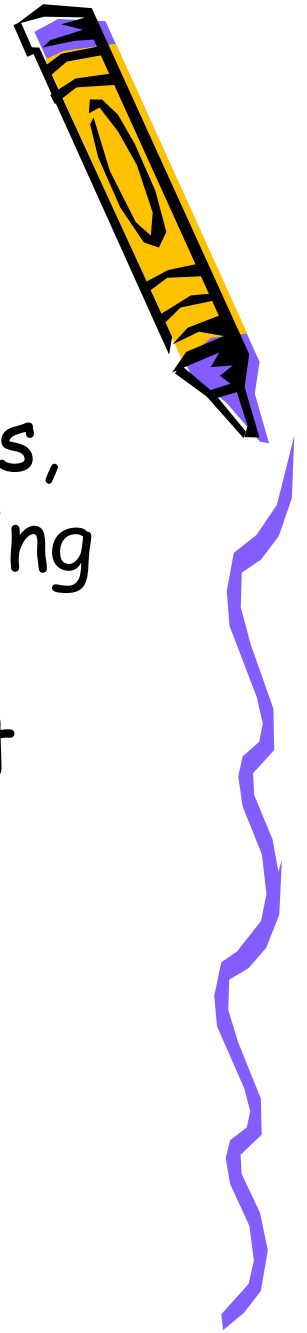
Outcomes of Today's Workshop

- Understand basic aspects of human nutrition
- Recognize nutrition issues common in young children with special needs
- Review some of the special diets seen in children with special needs, particularly child with ASD



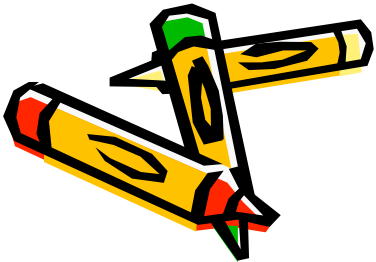
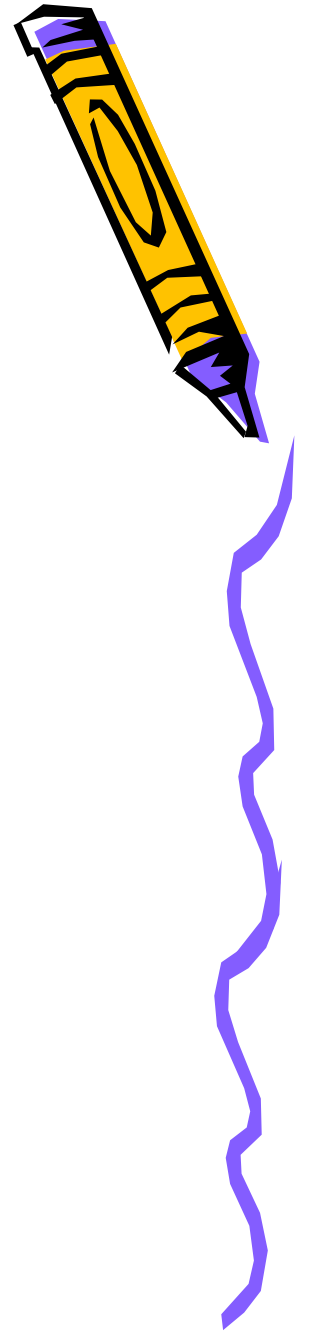
Outcomes of Today's Workshop

- Identify family concerns, priorities, experiences and resources regarding nutrition and feeding issues, and understand common stressors that families experience.
- Obtain resources for addressing feeding and nutrition issues.



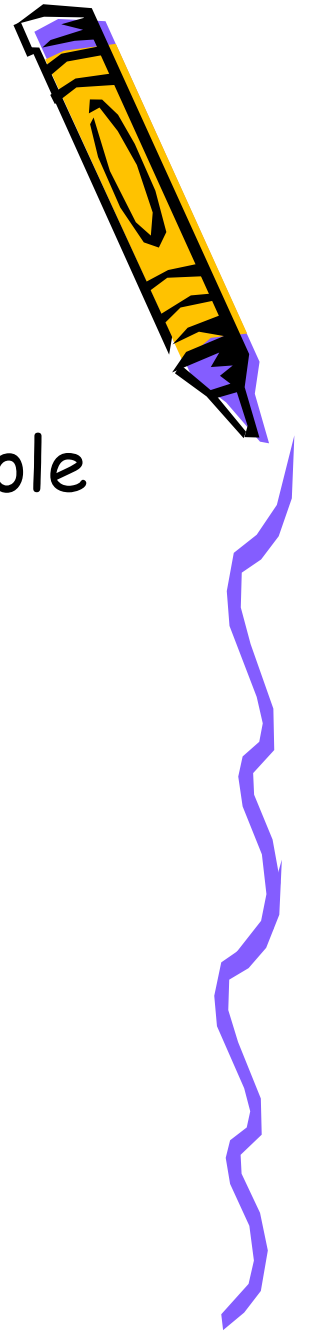
General Roles of the Feeding Team Members

- Family
- Special Educators and Paraeducators
- Nurse
- Occupational Therapist
- Speech Therapist
- Medical Specialists
 - Primary Care Physician
 - Pediatric Specialists (ie: Gastroenterologist)
- Registered Dietitian (Nutritionist)



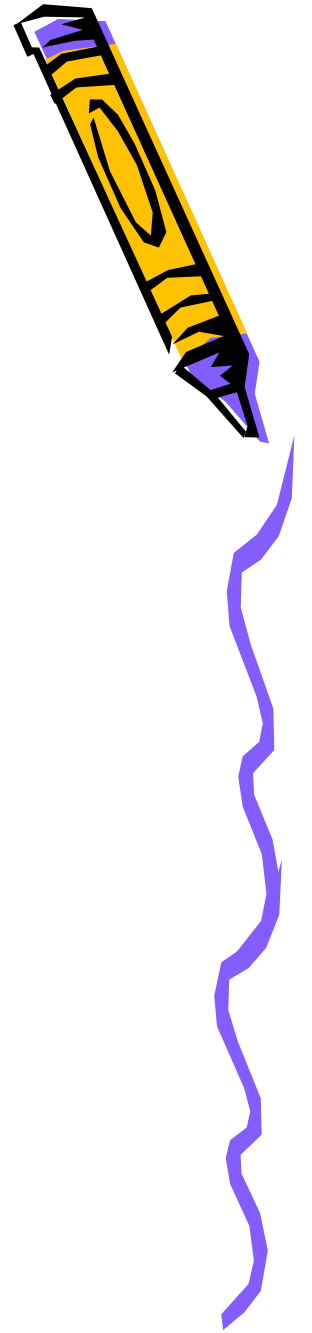
Common Stressors Families Experience

- Issues with confidence in parenting role
- Isolation
- Frustration
- Depression
- Feeling overwhelmed
- Too little or too much "help" from professionals



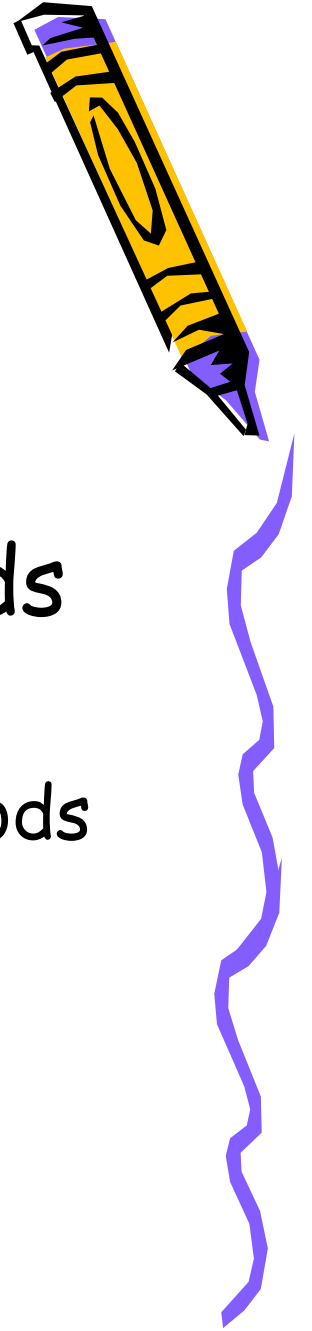
Potential Effects of Feeding Issues in Children

- Stress on the primary parent-infant relationship and family system
- Risk of nutritional deficiency (FTT)
- Slowed growth during rapid brain development
- Speech, language, cognitive and social/emotional issues



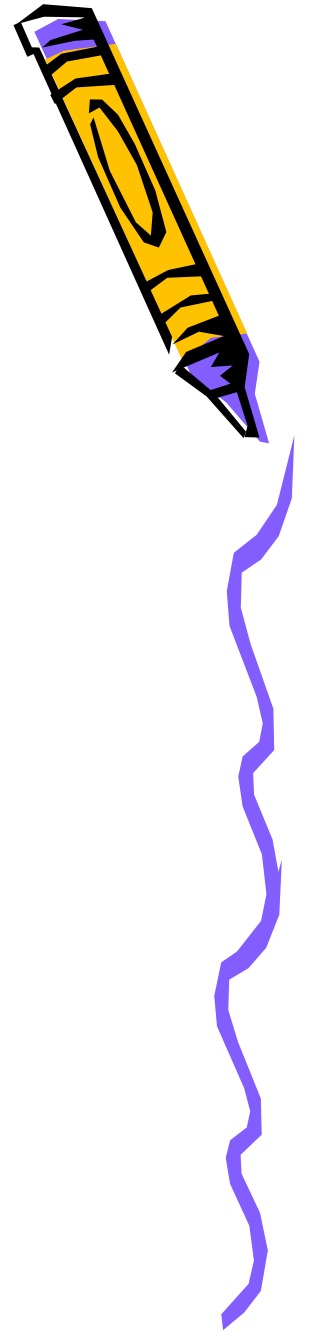
Nutrition Defined

- **Nutrition** - the science of foods and the nutrients they contain
 - Also consider the action of these foods and the nutrients in the body



Nutrition Defined

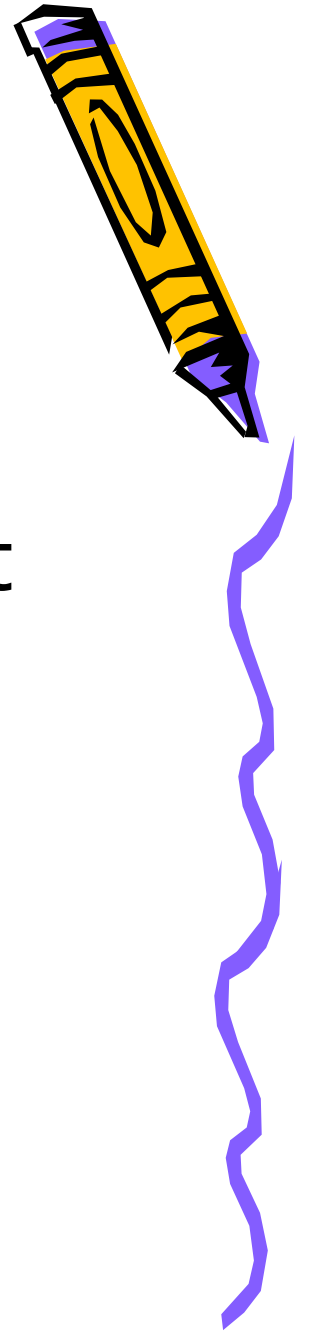
- Actions in the body include:
 - Ingestion
 - Digestion
 - Absorption
 - Transport
 - Metabolism
 - Excretion



Diet and Health

- Diet - the foods one consumes

The quality of your daily diet affects development and increase the risk of chronic diseases



What's Considered Food?

- **Foods** contain nutrients and are derived from plant or animal sources
- **Nutrients** are used by the body to provide energy and to support growth, maintenance and repair of body tissues

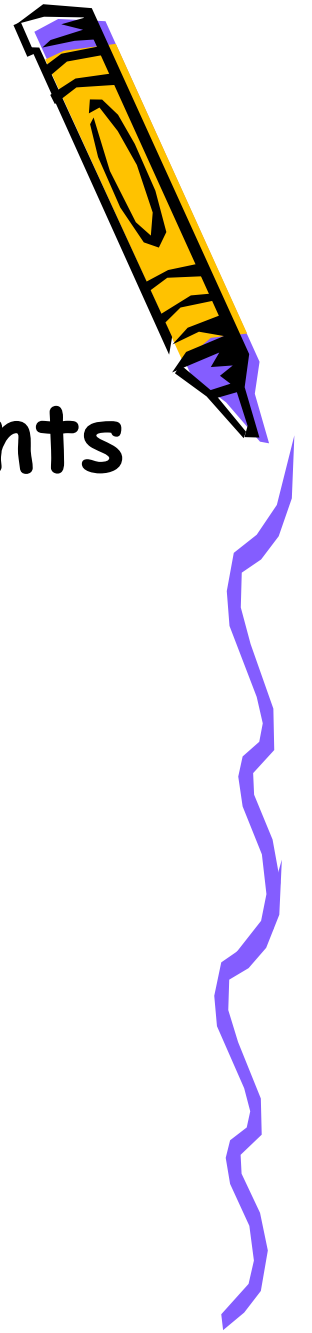
40 nutrients identified at this time



Classifying Nutrients

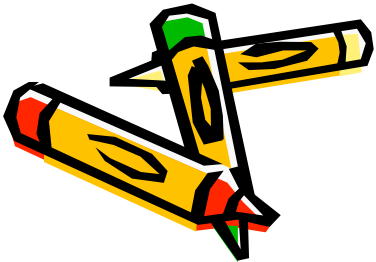
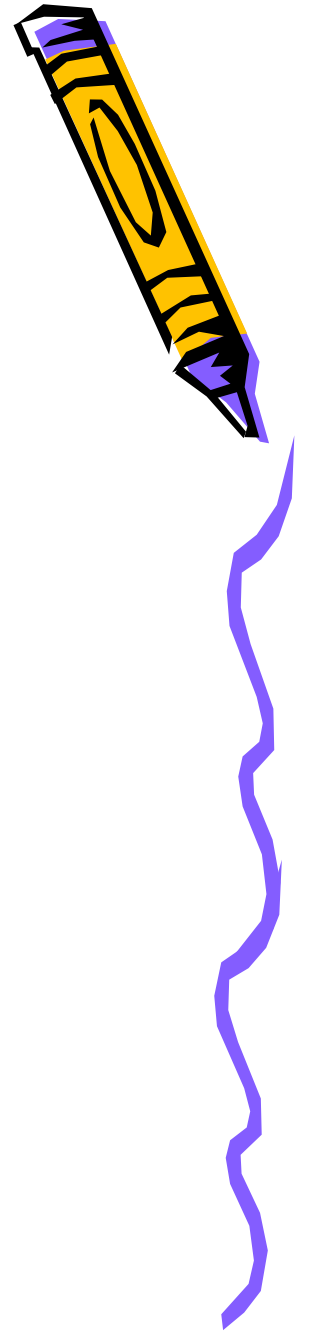
There are 6 Classes of Nutrients

1. Carbohydrates
2. Lipids (fats)
3. Proteins
4. Vitamins
5. Minerals
6. Water



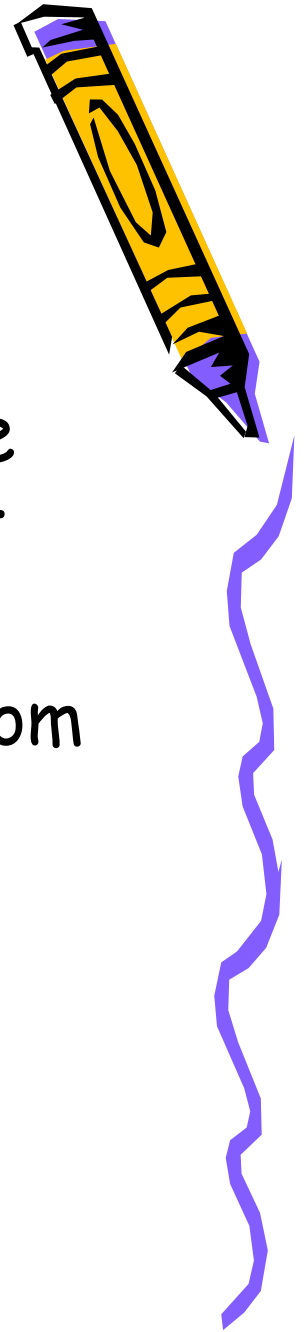
Describing the Nutrients

- There are several ways to classify the classes of nutrients.
 - Organic or inorganic
 - Essential or nonessential
 - Macronutrient or micronutrient
 - Energy yielding or not



Classifying Nutrients

- Essential nutrients - nutrients the body either cannot make or cannot make enough of to meet its needs.
 - These nutrients must be obtained from foods (ingested in some manner)
 - Examples:
 - Vitamins
 - Calcium, iron, and other minerals
 - Some of the amino acids



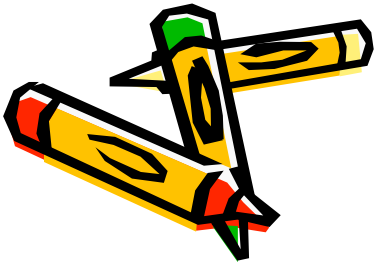
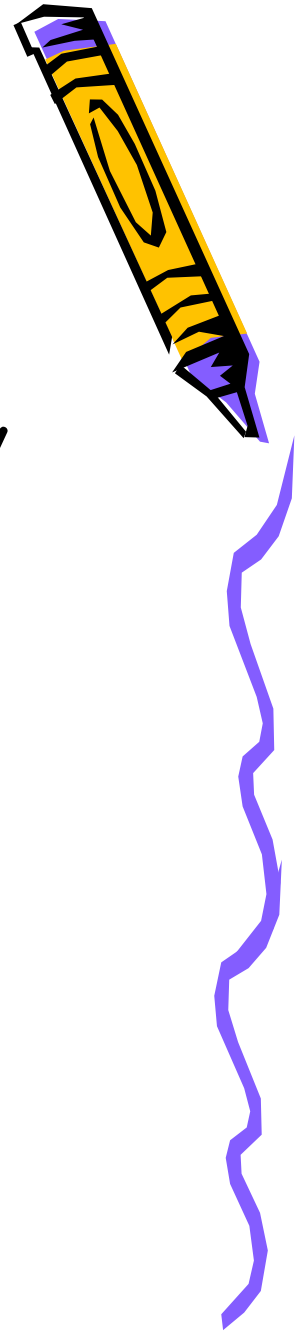
Quantity Needed

➤ Macronutrients: need in relatively large amounts

- Carbohydrates, lipids, proteins

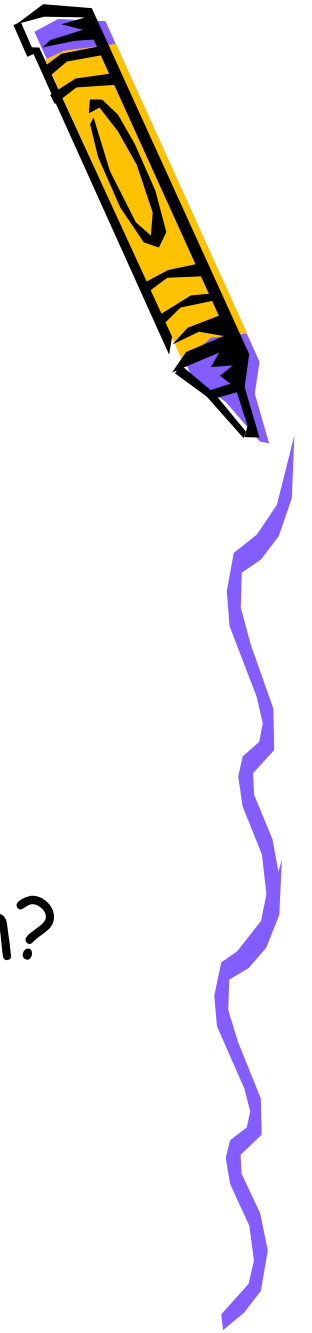
➤ Micronutrients: need in relatively small amounts

- All other nutrients



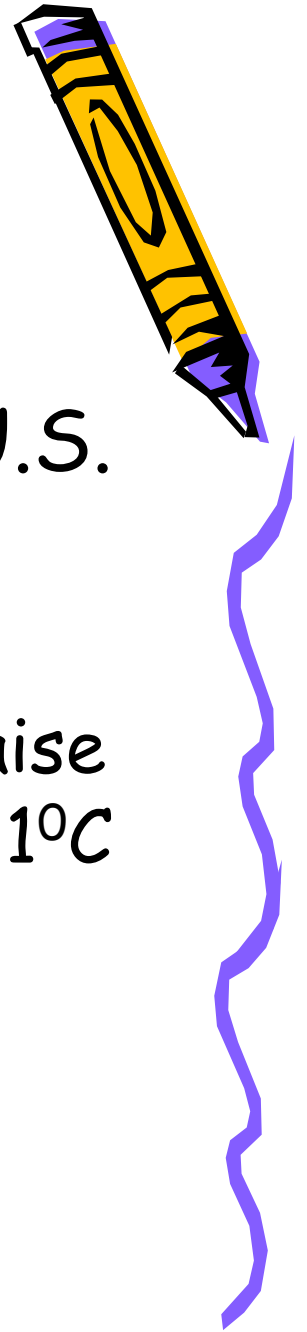
Classifying Nutrients

- Energy-yielding nutrients (3):
 - Carbohydrates
 - Fats (lipids)
 - Proteins
- Where does the energy come from?



A little more on energy

- Measure energy in kilocalories in U.S.
 - What most think of as a "calorie" is really a kilocalorie
 - Kcal = amount of energy needed to raise the temperature of 1 kg of water by 1°C



Energy-Yielding Nutrients

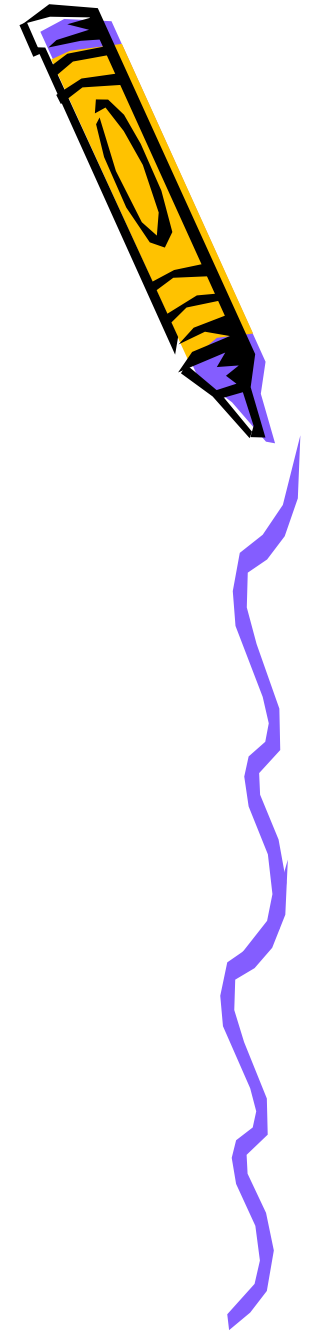
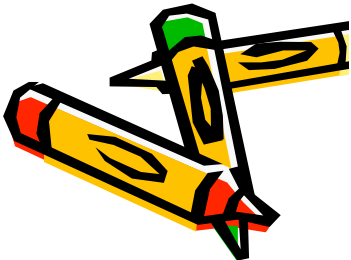


TABLE 1-2 kCalorie Values
of Energy Nutrients

Energy Nutrients	kCalories ^a (per gram)
Carbohydrate	4 kcal/g
Fat	9 kcal/g
Protein	4 kcal/g

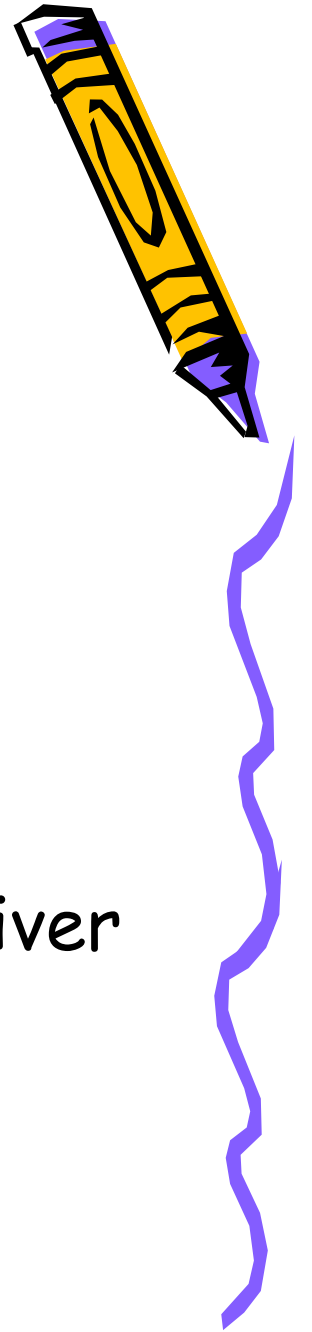
NOTE: Alcohol contributes 7 kcalories per gram that can be used for energy, but it is not considered a nutrient because it interferes with the body's growth, maintenance, and repair.

^aFor those using kilojoules: 1 g carbohydrate = 17 kJ; 1 g protein = 17 kJ; 1 g fat = 37 kJ; and 1 g alcohol = 29 kJ.



Energy-Yielding Nutrients

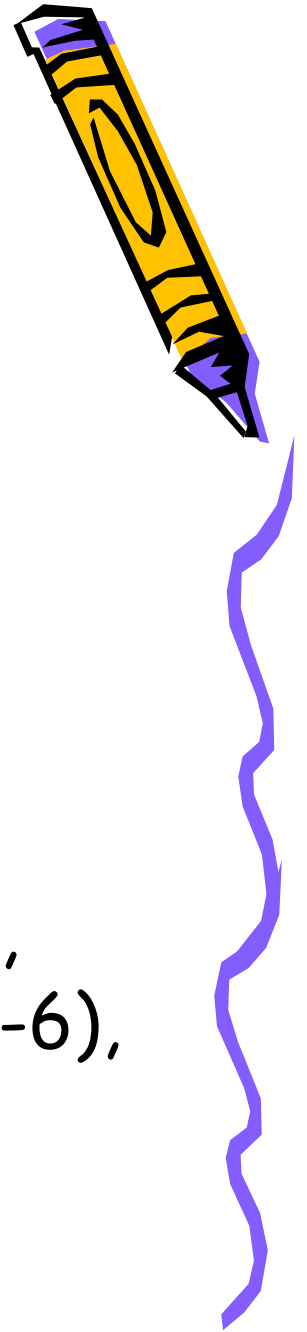
- **Carbohydrates: C, H, O**
 - 4 kcal/gram
 - Body's primary source of energy
 - Use as glucose
 - Brain's only source of energy
 - Stores are limited ~12-24 hours (in liver and muscle)
- Carbohydrate rich foods.....



Energy-Yielding Nutrients

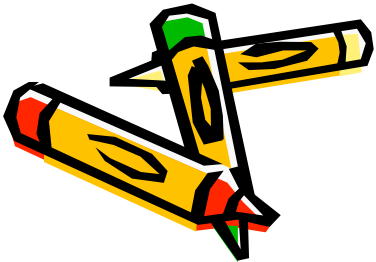
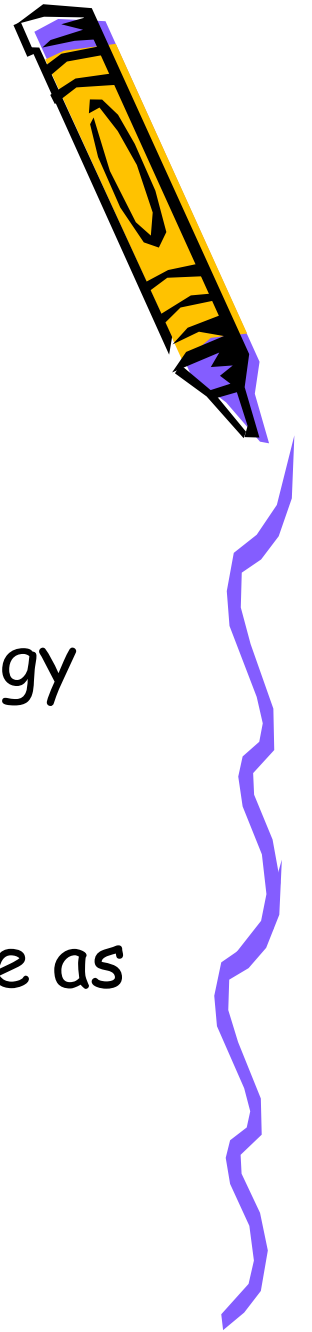
- Fats: C, H, O
 - 9 kcal/gram
 - Body's alternate source of energy
 - Use fat along with glucose as an energy source most of the time
 - 4 types: saturated, monounsaturated, polyunsaturated (omega-3 and omega-6), and trans-fat

Stores are unlimited



Energy-Yielding Nutrients

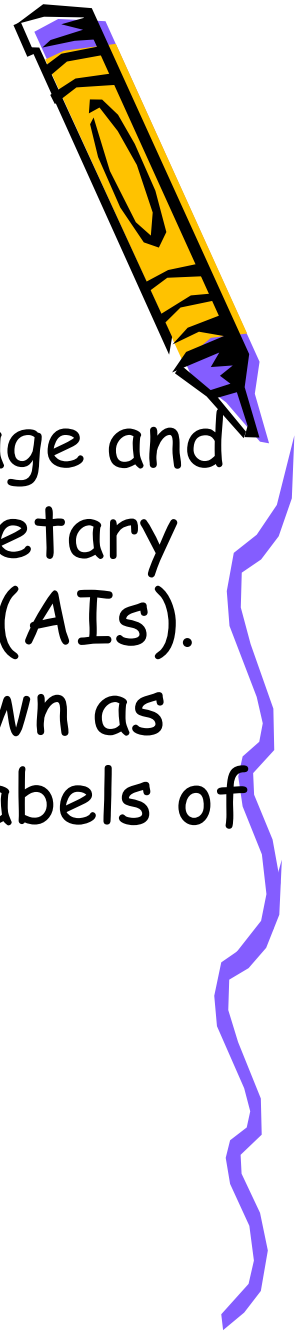
- Proteins: C, H, O, N, S
 - 4 kcal/gram
 - Body's least desirable source of energy
 - WHY?
 - Protein is used for energy only when there isn't any carbohydrate available as an energy source.



Daily Values

Recommended intakes of nutrients vary by age and gender and are known as Recommended Dietary Allowances (RDAs) and Adequate Intakes (AIs). However, one value for each nutrient, known as the Daily Value (DV), is selected for the labels of dietary supplements and foods.

<http://ods.od.nih.gov/HealthInformation/dailyvalues.aspx>

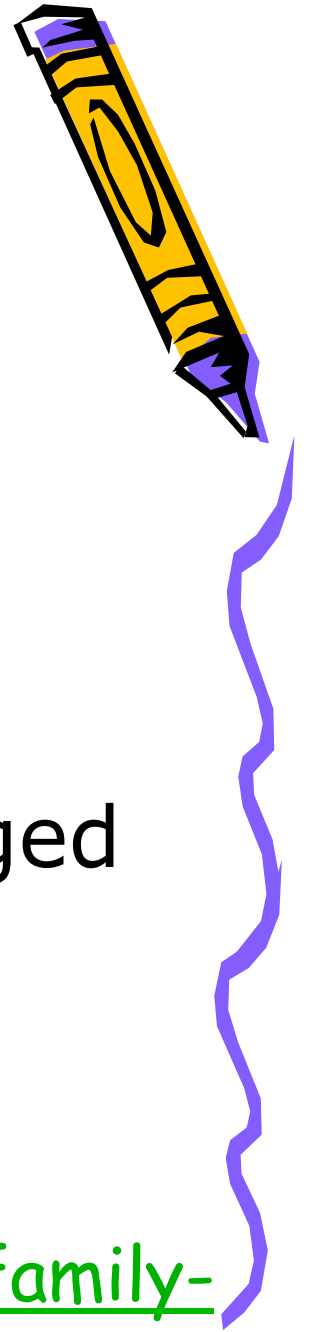


Vitamins

- Essential
- Organic, micronutrient
- Not energy-yielding
- Fairly easily destroyed/damaged
- Can be water-soluble or fat-soluble



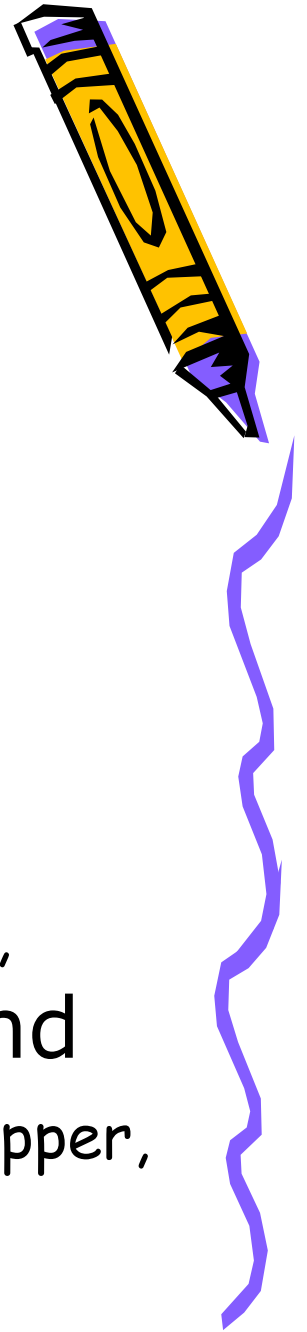
<http://www.askdrsears.com/topics/family-nutrition/vitamins>



Minerals

- Essential
- Inorganic, micronutrient
- Not energy-yielding
- Indestructible
- Macro (calcium, phosphorus, magnesium, sodium, potassium, chloride, and sulfur) and Trace minerals (iron, manganese, copper, iodine, zinc, cobalt, fluoride, and selenium)

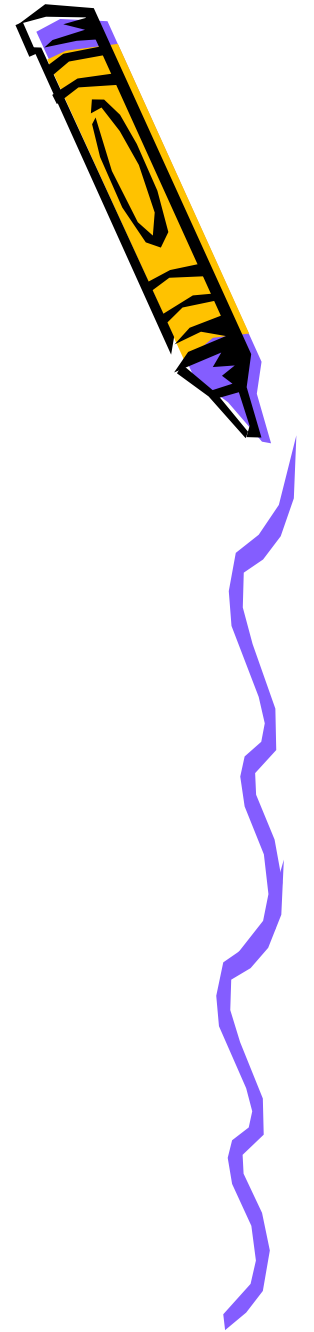
<http://kidshealth.org/parent/>



From Food Pyramids to "Choose My Plate"



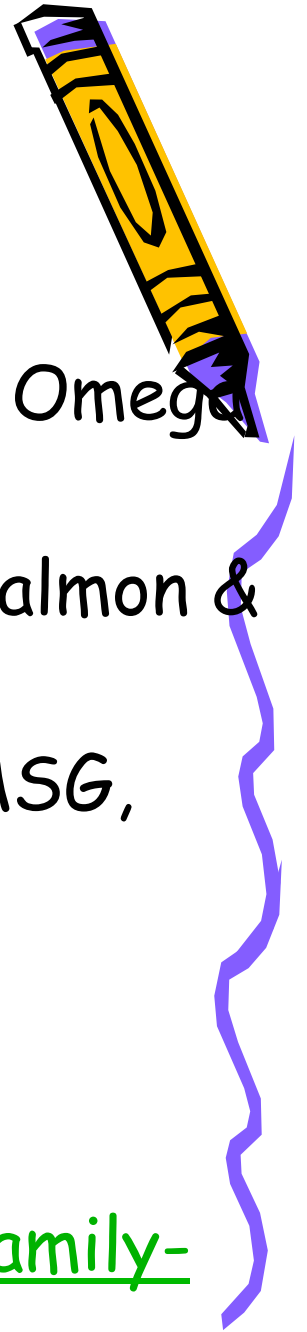
- <http://www.choosemyplate.gov/preschoolers.html>



Sear's Nutrition Deficit Disorder (NDD)

- "Brain Foods" especially foods with Omega 3 Fatty Acids (Fish)
- **Smart Foods:** Blueberries, Nuts, Salmon & Spinach
- **"Dumb" Foods:** Excitotoxins, e.g. MSG, aspartame, food colorings, and preservatives, fiber-poor carbs, hydrogenated oils, "Liquid candy" - sweetened beverages

<http://www.askdrsears.com/topics/family-nutrition/ndd>



Nutrition affects the brain in three ways:

- The cell itself needs proper nutrition to carry on its functions just like any other cell in the body.
- The myelin sheath covers the axon of the cell like insulation covering electrical wires. Deficiencies of nutrients that compose myelin, such as essential fatty acids, delay nerve-impulse transmission.
- The neurotransmitters, carry messages from one cell to the other and affect mood as well as thoughts and actions. Some of the nutrients become part of the neurotransmitters that help us think



The Science of Nutrition

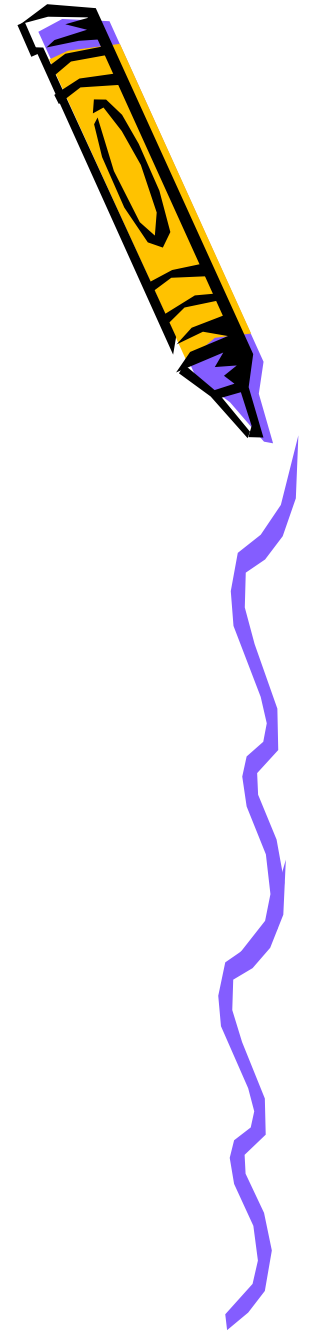
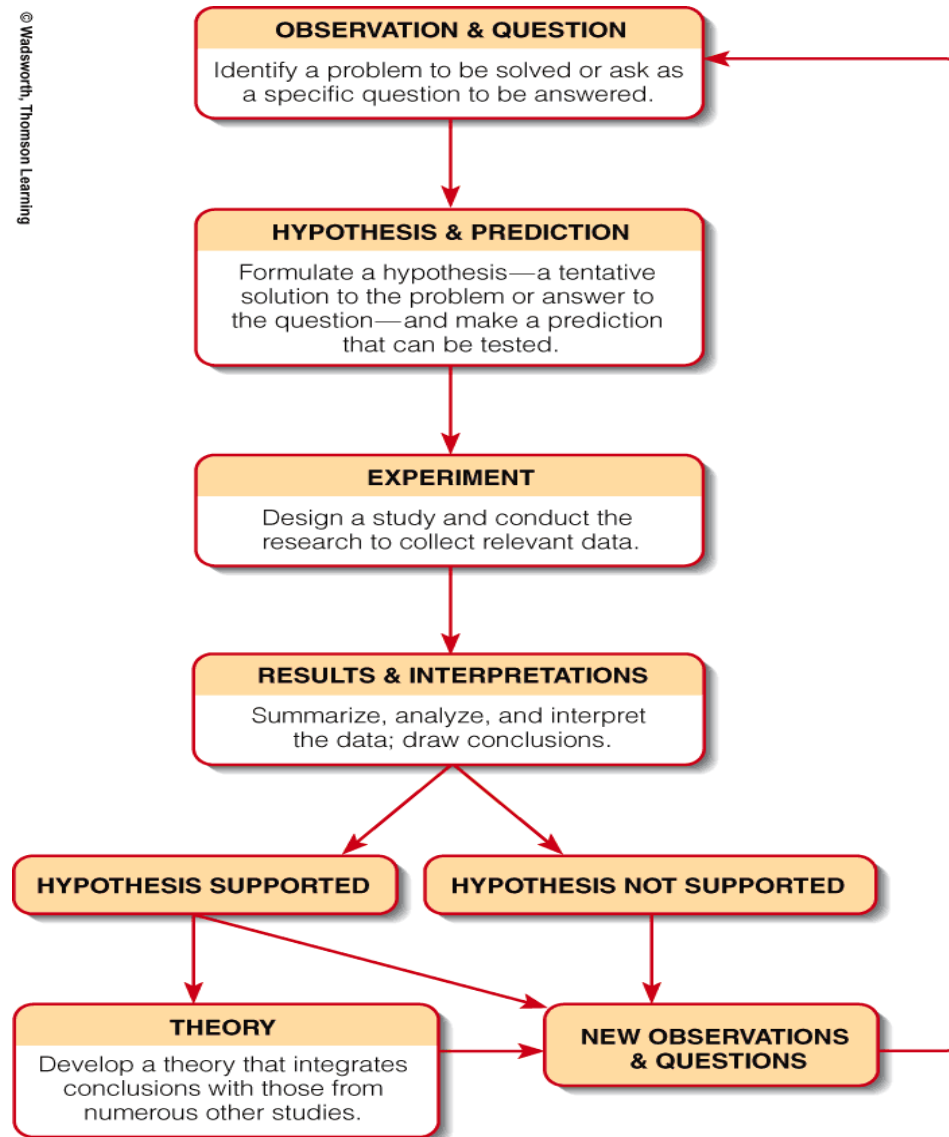
- Evaluating Internet Health Sites...Use Caution

<http://www.nlm.nih.gov/medlineplus/webeval/webeval.html>

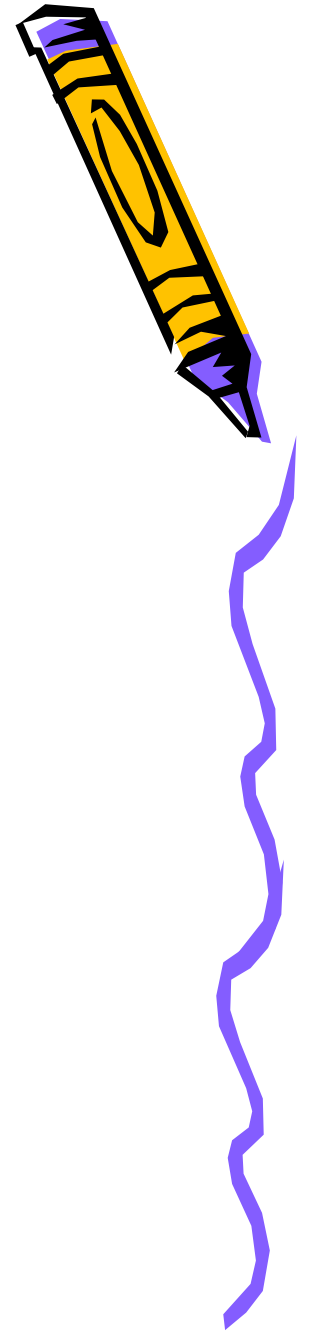
- What is the evidence....?
Empirical vs anecdotal
- Standards of care

<http://www.tacanow.org/family-resources/aap-standards-of-care/>



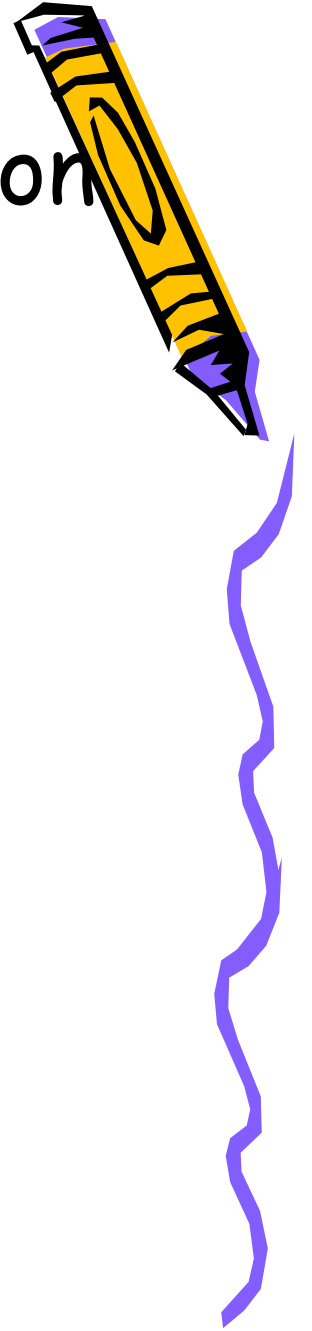


ASD - Brain - Nutrition



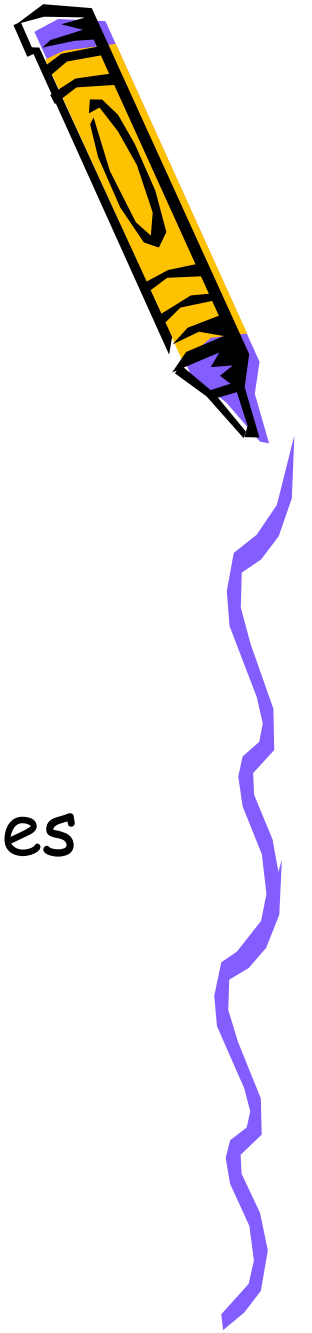
Nutrients Critical for Brain Function

- Protein
- Carbohydrate
- Fat
- Omega-3 Fatty Acids
- Amino Acids
- Vitamins
- Minerals
- Water



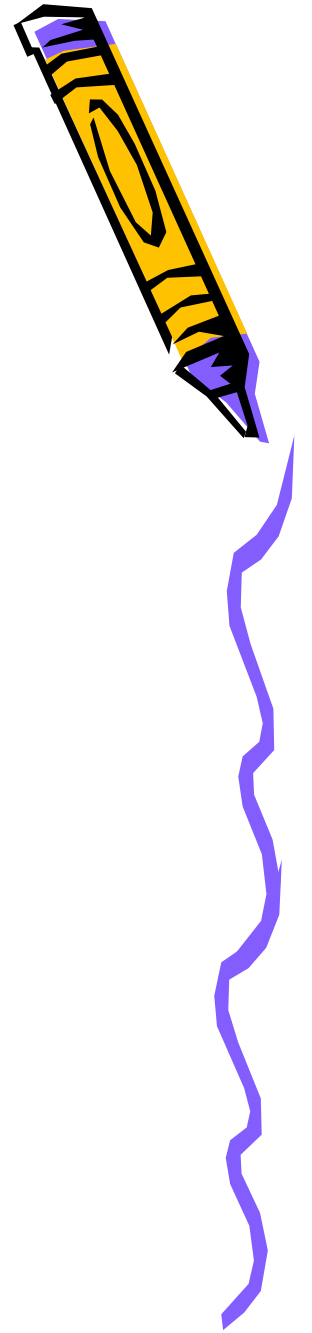
Common Nutrition and Feeding Concerns

- "Picky" eating behaviors
- Difficulty with transitioning to age-appropriate diet
- Increased sensory sensitivity
- Oral motor and/or motor planning issues
- Short attention span
- Limited variety in diet
- Need for routine



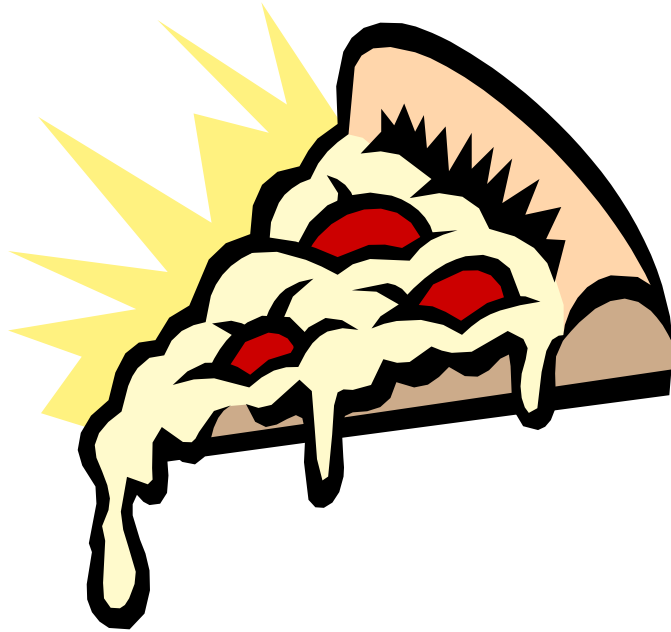
Eating Preferences

- Preference for dry, crunchy foods
- Refusal of soft, smooth textures
- Dislike of fruits and vegetables
- Preference for finger foods
- Preference for certain brands and preparation methods
- Preference for food of particular color(s)



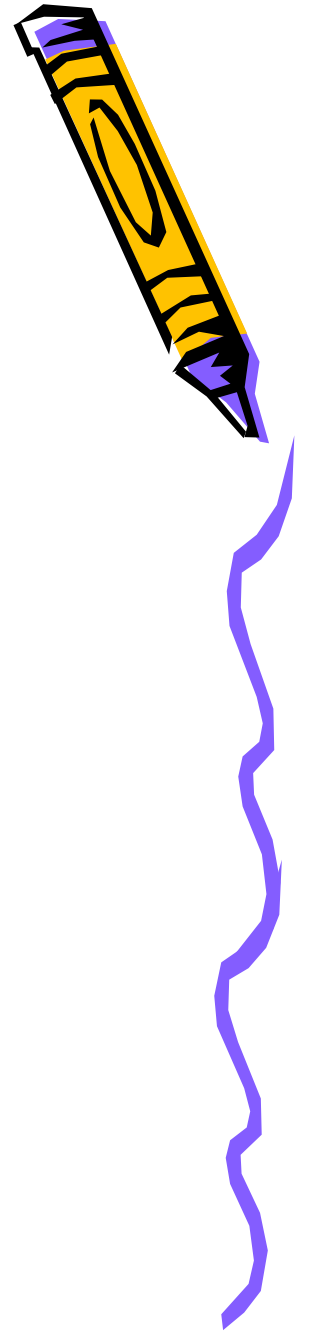
Preferred Foods

- dry cereal
- crackers
- chicken nuggets
- pizza
- bread
- hot dogs
- pasta



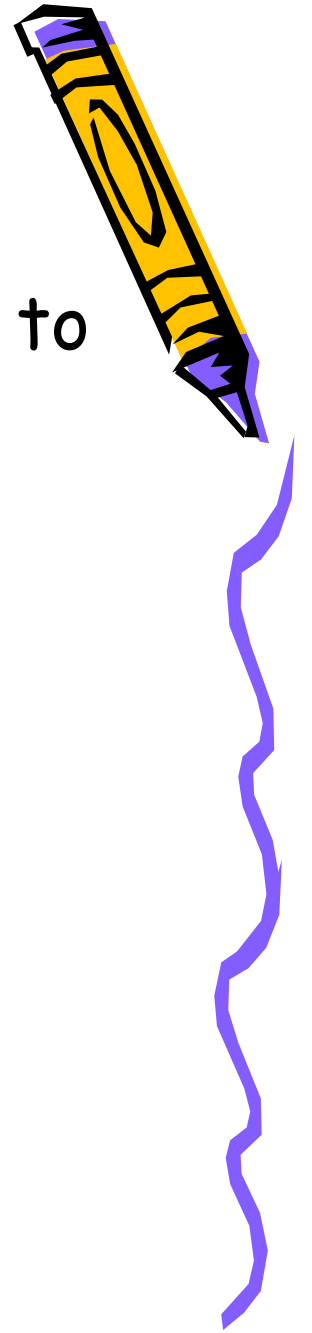
Other Nutrition Concerns

- Vitamin and mineral deficiencies
- Gastrointestinal concerns (reflux, constipation, diarrhea)
- Drug-nutrient interactions
- Food allergies and Celiac disease
- Alternative therapies (CAM)



Nutrition Therapies

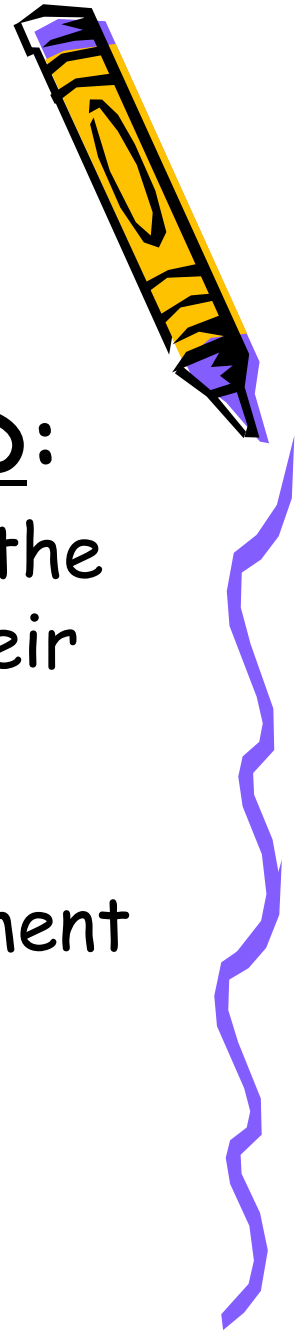
- Still limited evidence-based research to show effectiveness of alternative treatments= Need for more research
- New gf/cf study [2/12} just released
<http://www.sciencedaily.com/releases/2012/02/120229105128.htm>
- Need to be individualized
- Select therapy with caution and be aware of possible toxicity



Nutrition Therapy

Goal of Nutrition Therapy for ASD:

- Support the structure and function of the child's brain and body to perform at their optimum level.
- Maximize the child's brain function to enhance their response to other treatment approaches (SLP, OT, PT, Behavioral, Special Education Instruction, etc...).



Nutrition Therapy

From Elizabeth Strickland RD
"Eating For Autism"

Heal the Child's gut

Elimination/Challenge Diet

Identify & Treat Food Allergies

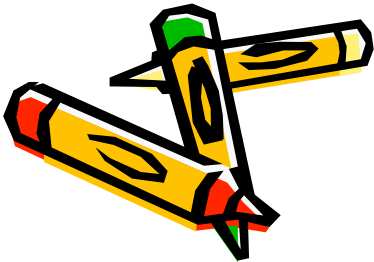
Treat the Feeding Problem

Herbs, Nutraceuticals, and Nutrients

Enhance Child's Cognitive Function

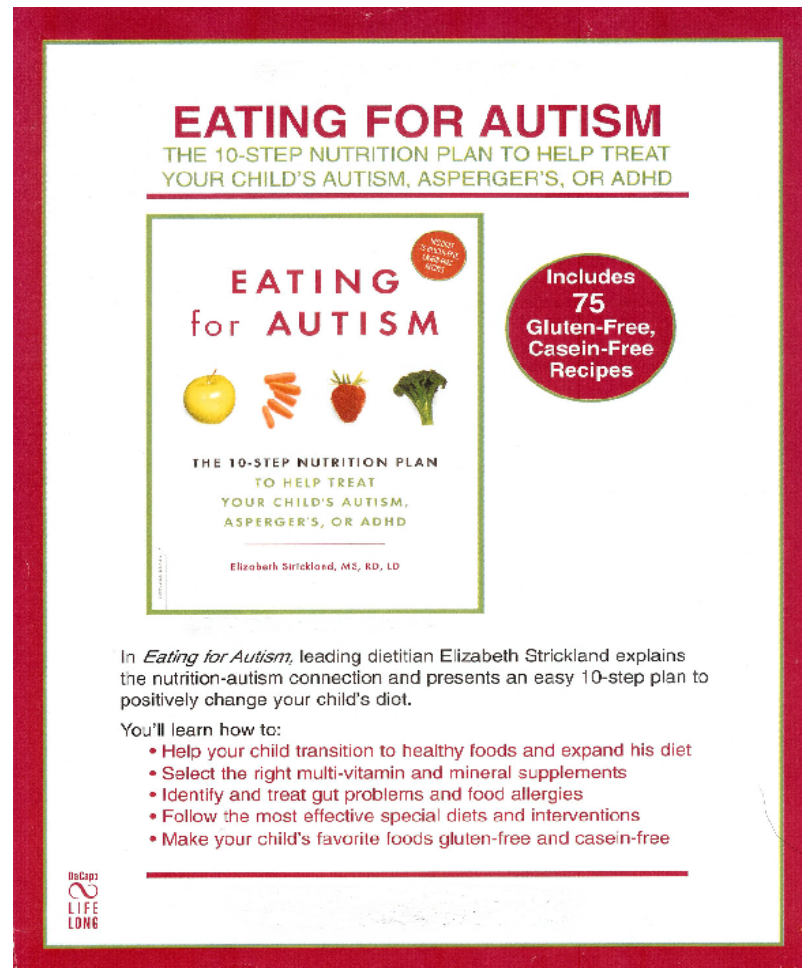
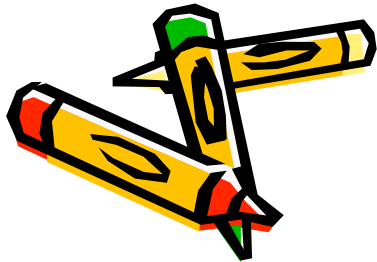
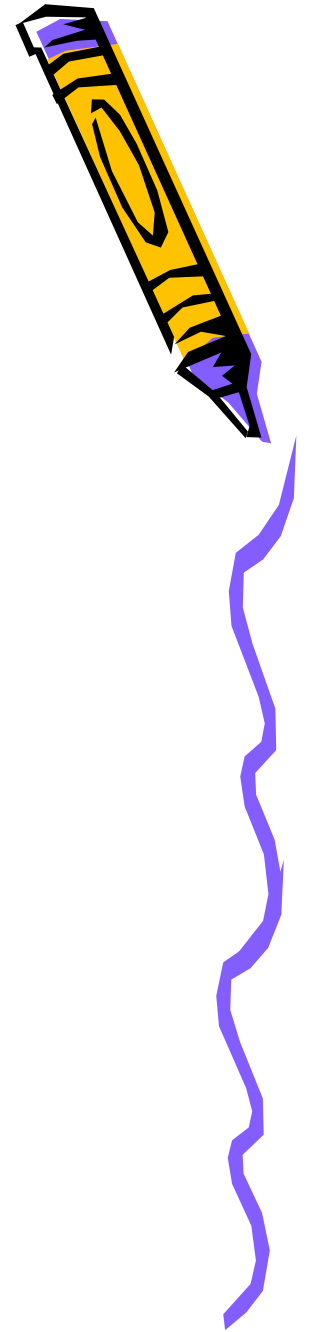
Enhance the Immune System

Enhance the Detoxification System



"Eating for Autism"

** Many of the following slides are from Elizabeth Strickland book and presentation



Eating for Autism

The 10 - Step Nutrition Plan to Help Treat Autism

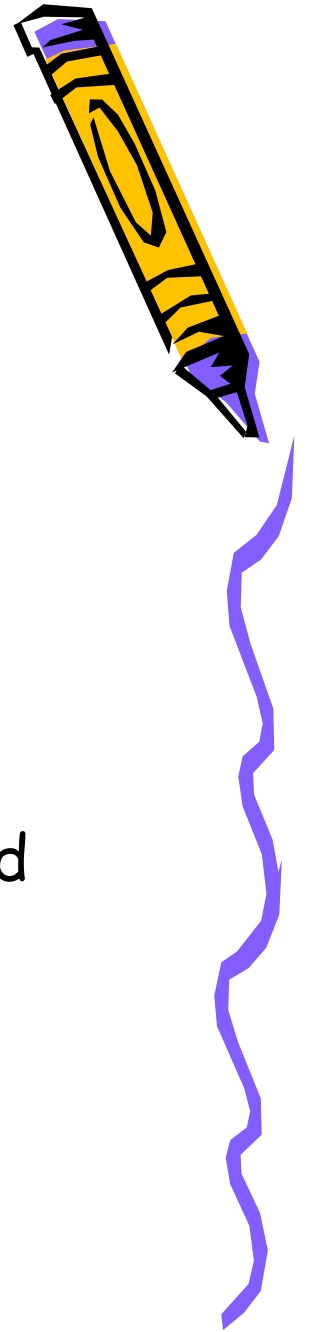
- Transition to a healthy diet
- Consume adequate basic nutrients
- Select a multi-vitamin/mineral supplement
- Select an omega-3 fatty acid supplement
- **Treat child's feeding problem**
- Heal the gastrointestinal tract
- Identify and treat food allergies
- Consider special diets
- Trial response of high dose vitamin B6
- Consider additional supplements

<http://www.asdpuzzle.com/eating-for-autism>



Adverse Reactions to Food

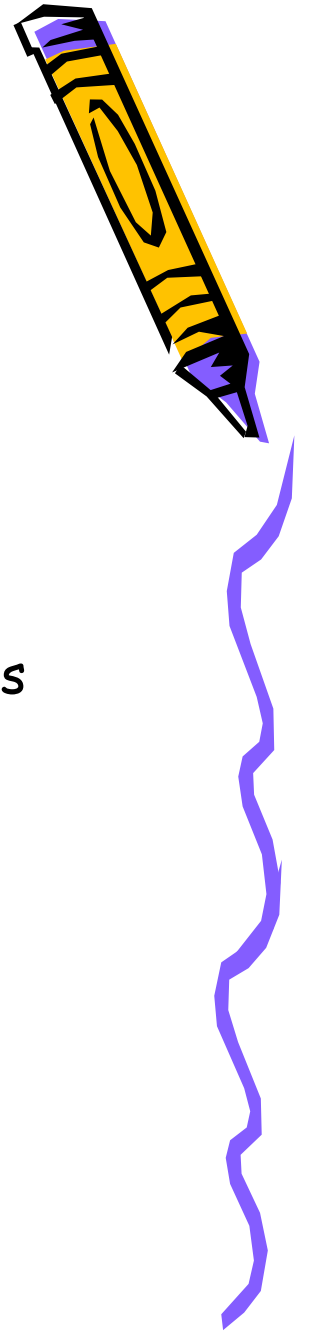
- Toxic
- Non-Toxic
 - Food Intolerances: metabolic, pharmacologic, idiosyncratic
 - More likely to occur in ill or malnourished
 - Food Allergies:
 - IgE
 - Non- IgE
 - Mixed IgE and Non IgE



Nutrition Therapy

Components of a Nutrition Assessment:

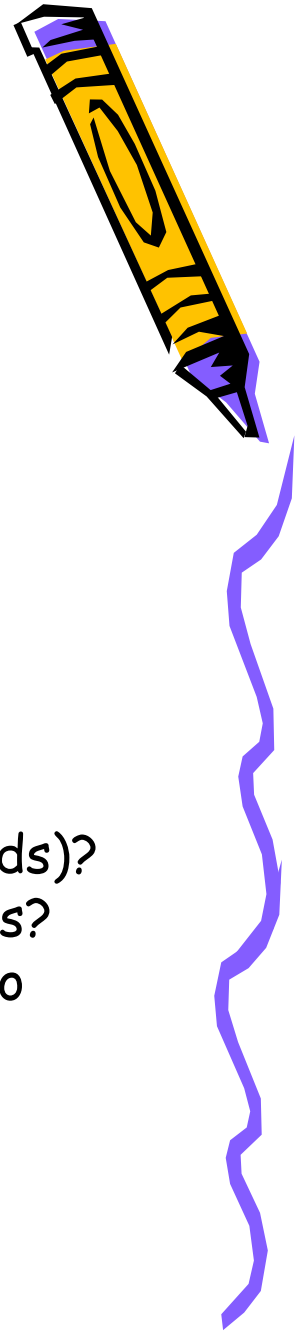
- 1.) **Anthropometrics**- Growth measurements
- 2.) **Biochemical**
- 3.) **Clinical**
- 4.) **Dietary**
- 5.) **Environmental**
- 6.) **Feeding**



Nutrition Therapy

Feeding Assessment

- Does your child have a history of any of the following?
 - Reflux
 - Problems with breast-feeding
 - Problems with bottle feedings
 - Difficulty transitioning from baby food to table foods
 - Fed a special formula as an infant
- Does your child eat a limited variety of foods (< 20 foods)?
- Does your child tantrum when presented with new foods?
- Has your child discontinued eating foods he/she used to eat?
- Does your child have any rituals at meal-time?
- Does your child refuse foods of a certain texture?



Nutrition Therapy

Feeding Assessment

- Does your child need assistance to feed himself?
- Does your child use age appropriate feeding and drinking utensils?
- Does your child have trouble chewing or swallowing?
- Does your child express hunger?
- Does your child have a good appetite?
- Is food or candy ever used as a reward?
- Has your child ever received Feeding Therapy?
- Are you concerned that your child has a feeding problem?



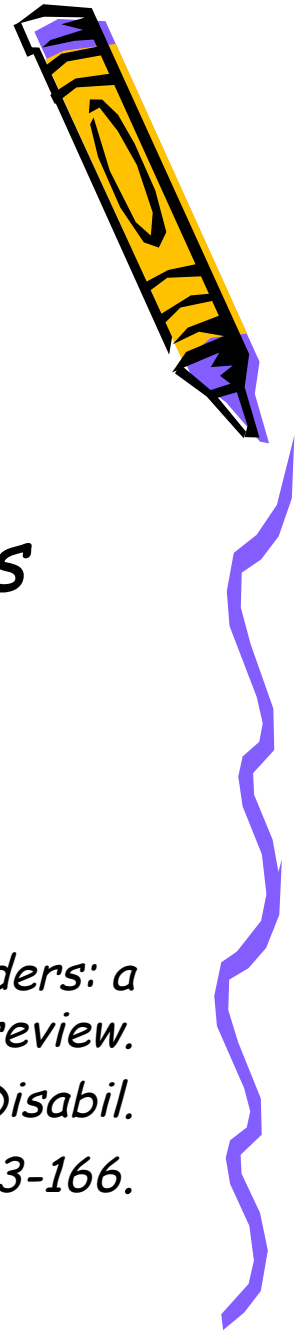
Autism & Feeding Problems

"The prevalence of problem eating behaviors in children with autism has been estimated to range between 46% and 89%."

Feeding problems in children with autism spectrum disorders: a review.

Focus Autism Other Dev Disabil.

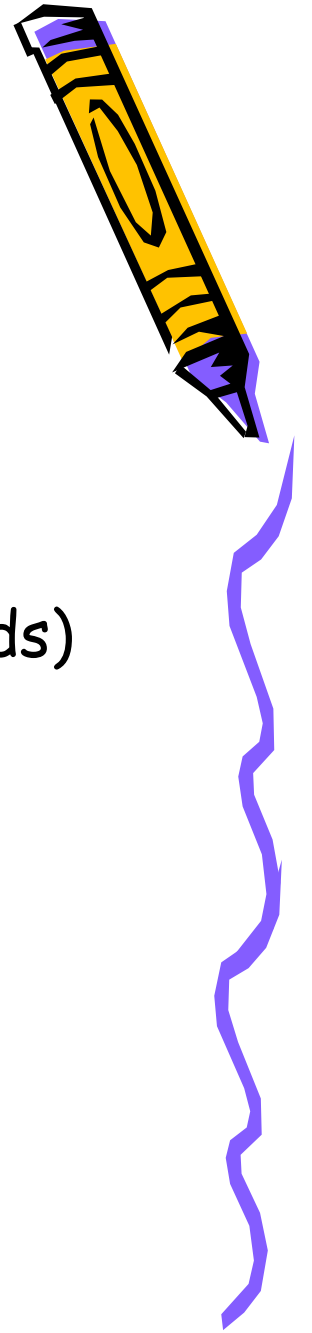
2006;21(3):153-166.



Autism & Feeding Problems

Common Mealtime Behaviors:

- Selective food refusal
- Food neophobia (fear of trying unfamiliar foods)
- Nonfunctional mealtime rituals
- Tantrums



Picky Eater vs. Problem Feeder

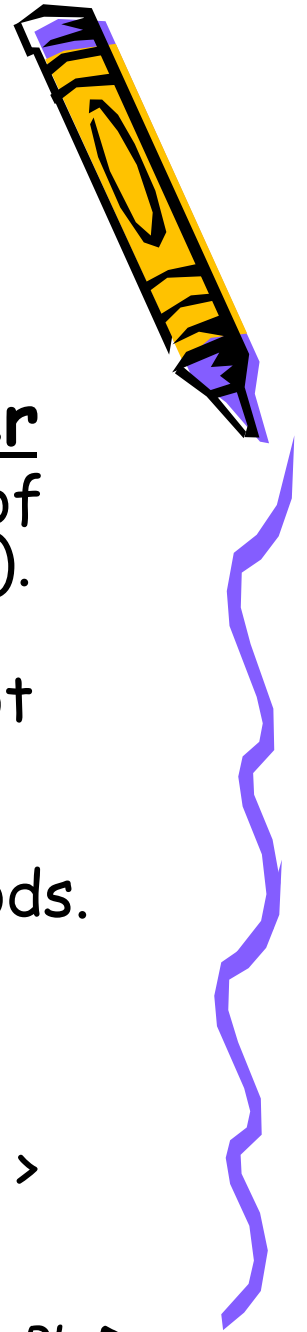
Picky Eater

- Decreased variety of food (< 30 foods).
- Foods lost due to burn-out. Regained after 2 weeks.
- Able to tolerate new foods on plate, touch, or taste.
- Eats at least 1 food from most food textures.
- Adds new foods to repertoire in 15-25 steps.

Problem Feeder

- Restricted range of foods (< 20 foods).
- Foods lost due to burn-out, foods not regained.
- "Falls apart" when presented new foods.
- Refuses entire categories of textures.
- Adds new foods in > 25 steps.

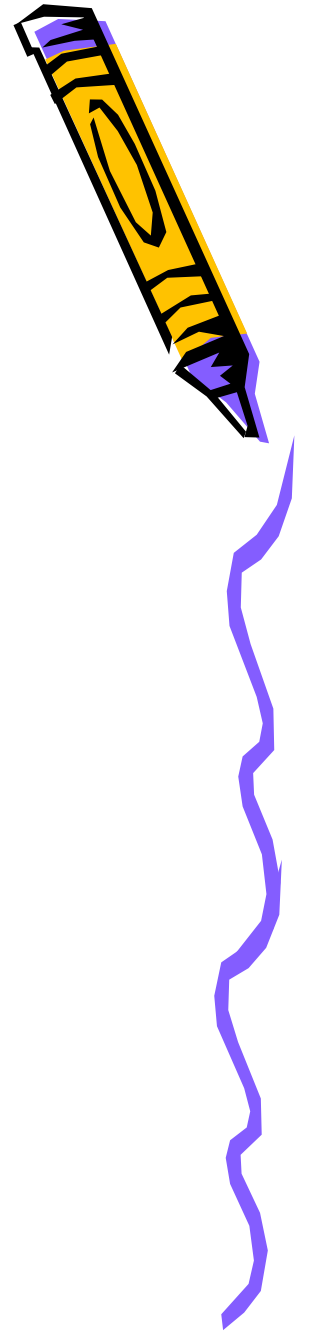
Kay Toomey, Ph.D.



Contributing Factors

Medical

- Food allergies, sensitivities, and intolerance
- Medication side effects
- Previous invasive interventions
- Dental problems
- Gastrointestinal Disorders



Gastrointestinal Disorders

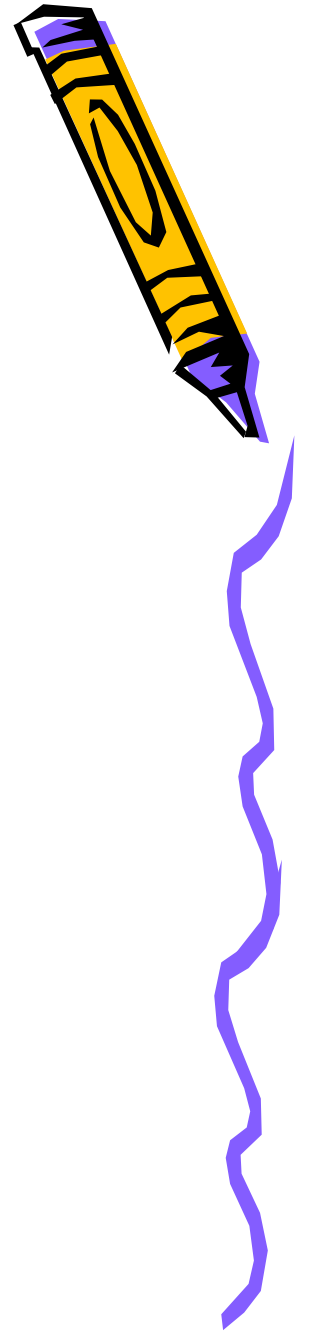
- Studies suggest that the majority of children with autism may have a gastrointestinal disorder.
- Most of these children continue to suffer with undiagnosed GI disorders unable to verbally express the pain they feel.
- Identifying and correcting the child's GI disorder can lead to significant overall improvement in digestion, health, behavior, and brain function.



Gastrointestinal Disorders

Gastrointestinal Symptoms

- Reflux
- Vomiting
- Abdominal pain
- Bloating
- Flatulence
- Diarrhea
- Constipation
- Infrequent stool
- Straining to pass stool
- Loose stool



Gastrointestinal Disorders

Vocal Behaviors

- Clearing of throat
- Screaming
- Sobbing
- Whining
- Moaning
- Delayed echolalia
- Direct verbalizations

Motor Behaviors

- Facial grimacing
- Gritting teeth
- Grazing
- Mouthing on clothes
- Unusual posturing
- Pacing
- Jumping up and down
- Self-jury
- Aggression
- Puts pressure on abdomen



Gastrointestinal Disorders

Changes in Overall State

- Sleep disturbances
- Increased irritability
- Oppositional behavior

Mealtime Behaviors

- Food refusal
- Limited variety of foods
- Mealtime tantrums
- Discontinue eating foods used to eat



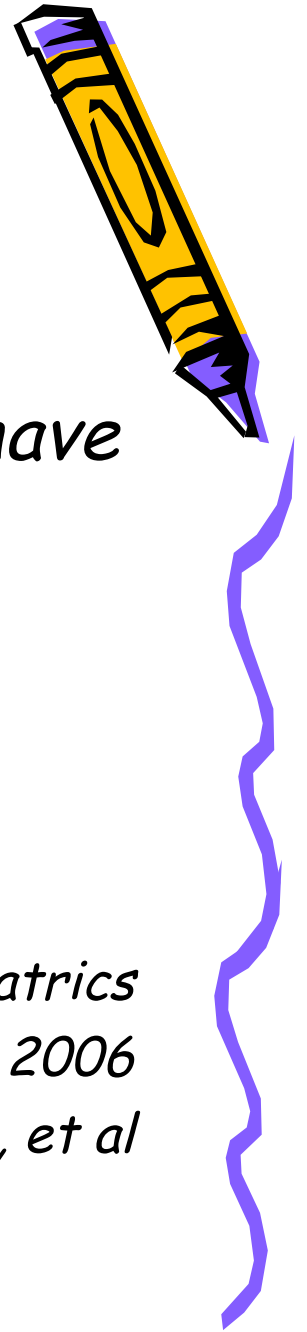
Gastrointestinal Disorders

"70% of autistic children were found to have a lifetime history of gastrointestinal symptoms such as abnormal stools, constipation, frequent vomiting, and abdominal pain."

Journal of the Developmental and Behavioral Pediatrics

April 2006

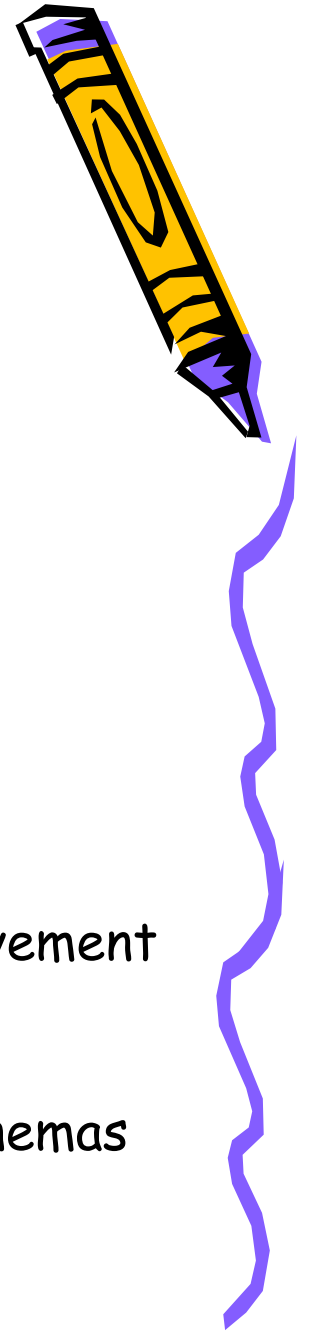
Niehus, et al



Gastrointestinal Disorders

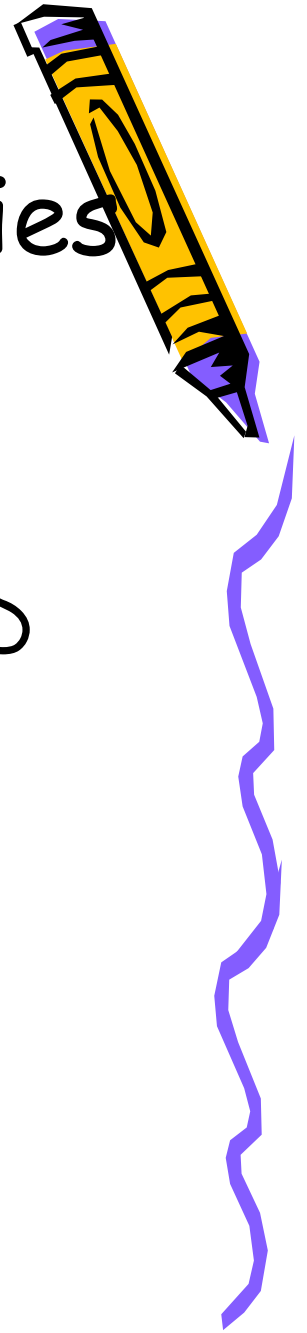
Contributing Factors to GI Disorders:

- Nutrient deficiencies
- Malnutrition
- Inadequate water intake
- Inadequate fiber intake
- Low or increased muscle tone
- Decreased physical activity
- Irregular toilet habits
- Unable to communicate need to have a bowel movement
- Holding their stool
- Medication side effects
- Long-term use of laxatives, suppositories, and enemas
- Cow's milk allergy
- Medical conditions



Potential Nutritional Deficiencies

- Protein
- Vitamins:
 - C, E, B- complex, B 6, Vitamin D
- Minerals:
 - Calcium, magnesium, chromium
- Calories
- Fiber



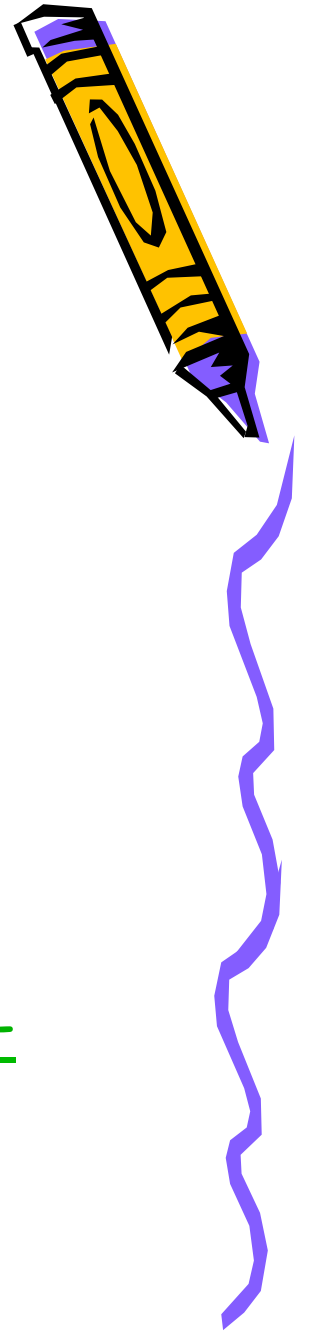
Resources --Special Diets Seen in Children with ASD

* Autism Research Institute (DAN)

http://www.autism.com/faq_diets.asp

* Autism Speaks

<http://www.autismspeaks.org/news/news-item/ian-research-report-special-diets>



Autism Diets

- GFCF (Gluten-Free Casein-Free)
- Low Oxalate
- SCD (Specific Carbohydrate)
- Body Ecology
- Feingold
- Weston A. Price (Nourishing Traditions)

nourishinghope.com/

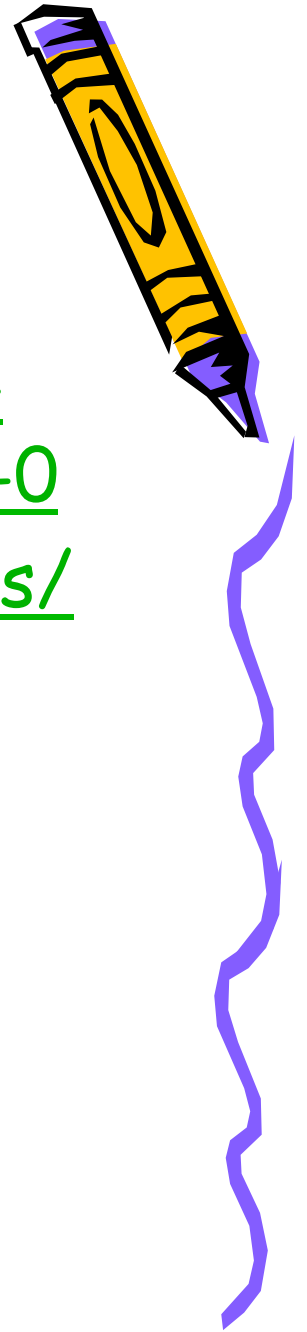


GF/CF

<http://www.autismone.org/content/step-step-approach-implementing-gfcf-diet-0>

<http://www.tacanow.org/family-resources/gfcfsf-diet-on-a-budget/>

- The place many families start...
 - Many families have positive results
 - Restrictive diet - socially isolating



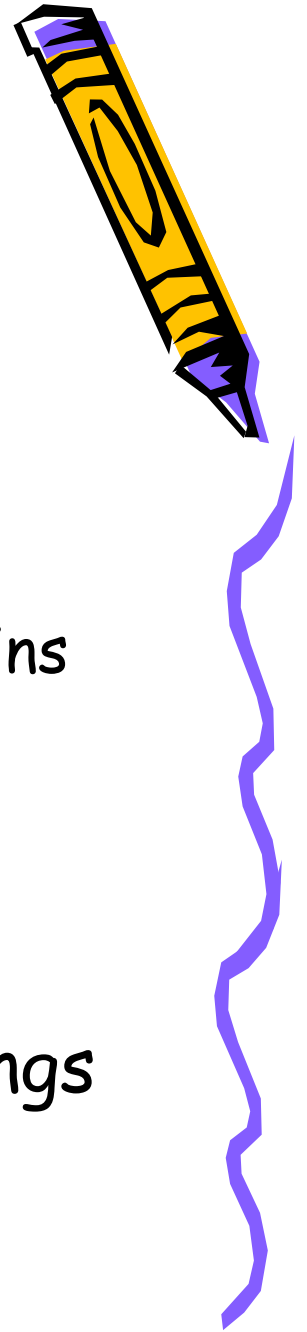
Gluten Content of Foods

- Gluten
 - Commonly found in Wheat, Rye and Barley
 - Breads, pastas, cereals, processed foods
 - Oats safe grain but caution with cross contamination
 - Hidden sources - potential problem
 - Thickener for soups, gravies, sauces
 - Art and craft supplies
- Ubiquitous ingredient



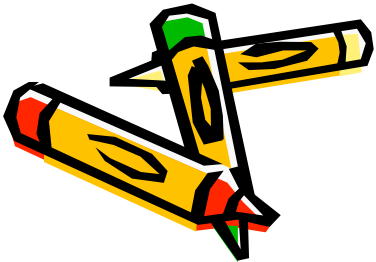
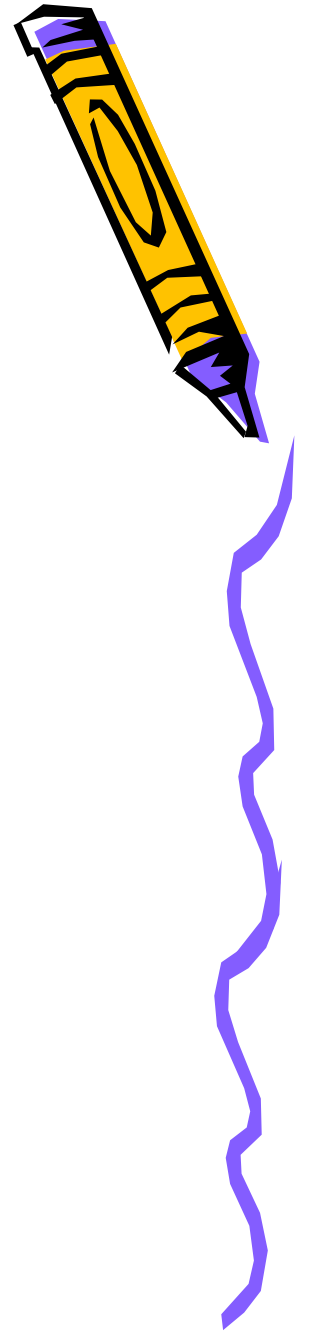
Research conclusions

- Gluten-free diet
 - Potentially deficient in:
 - calcium, fiber, iron and B Complex vitamins
- Alternatives
 - Increase use of greens, fruits and folate rich vegetables - Hallert
 - Increase total number of grain servings per day, especially whole grain - Thompson



Casein Content of Foods

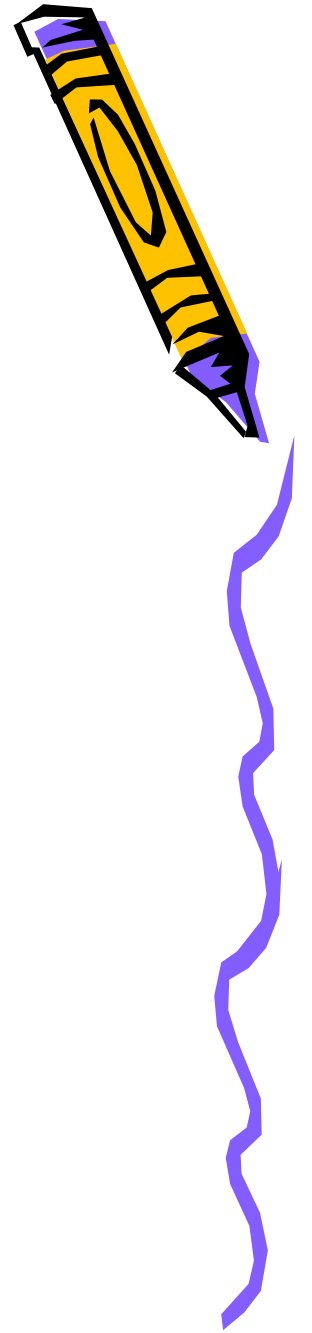
- Casein
 - Protein found in milk
 - Yogurt, puddings, cheese, ice cream
 - Added to breads, crackers, cookies
 - Labels
 - Listed as milk, dry milk powder, sodium caseinate, hydrolyzed protein



Casein content of foods

- Hidden sources
 - Packaged mixes
 - Sauces
 - Baked products
 - Snacks and snack bar

CAREFUL LABEL READING***



Nutritional Approach to GFCF

- Careful label reading
- Many non gluten or casein based items could be potentially irritating
 - Many hidden sources of gluten and casein
 - Many sugar substitutes
 - Many gums
 - Many artificial colors, flavors etc



Mealtime Strategies

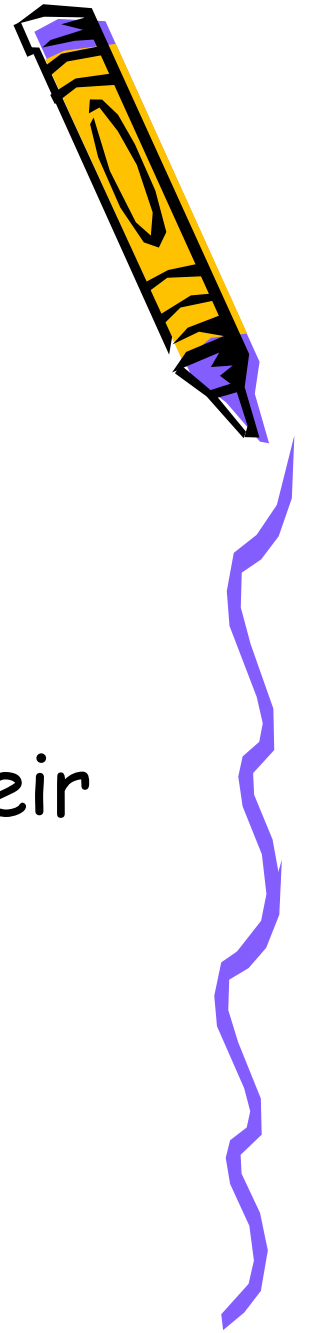
- Do NOT allow child to graze
- Schedule meal and snack times
- Limit juice, milk, and beverages to appropriate amounts
- Limit distractions during meals
- Social modeling
- Offer manageable foods
- Use verbal positive reinforcement
- Use appropriate mealtime language
- Avoid food burn-out



Feeding Therapy

What feeding methods are helpful?

A combination of feeding methods
varying for each child based on their
individual feeding problems.



Feeding Therapy

Building on preferred foods:

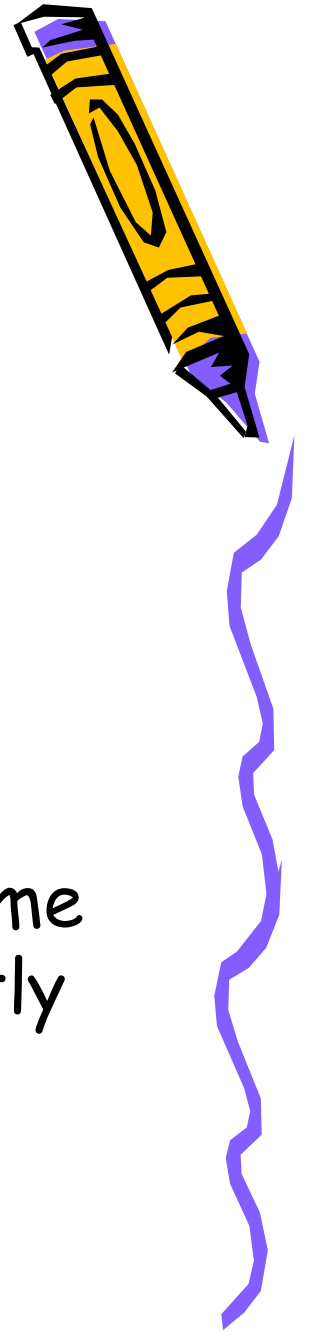
- Food Chaining

Cheri Fraker, CCC-SLP

Expands the child's food repertoire by introducing new foods that have the same features as the foods the child currently eats.



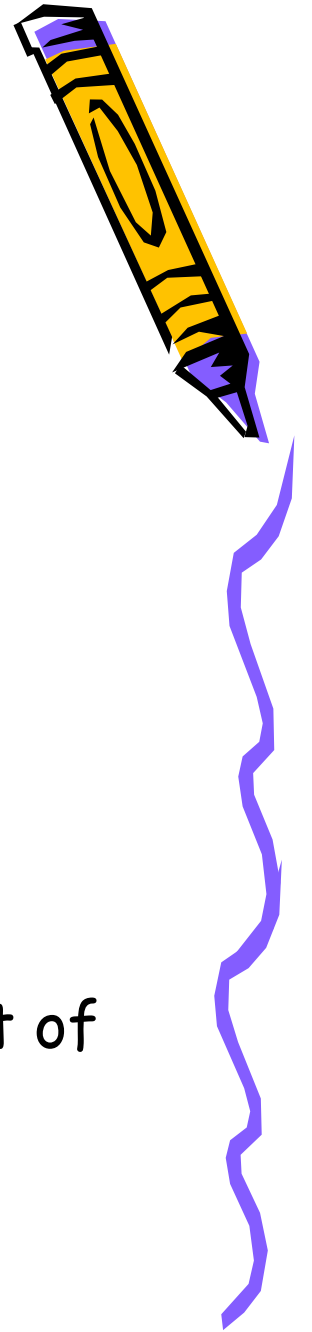
<http://cheriandlaura.blogspot.com/>



Feeding Therapy

Behavioral:

- Positive reinforcement
Tangible item and/or praise
- Escape extinction
Nonremoval of spoon and/or physical guidance
- Stimulus fading
Increasing the number of bites and/or amount of food presented on spoon



Feeding Therapy

Sensory:

- Sequential Oral Sensory Approach to Eating (SOS)

Dr. Kay Toomey, PhD

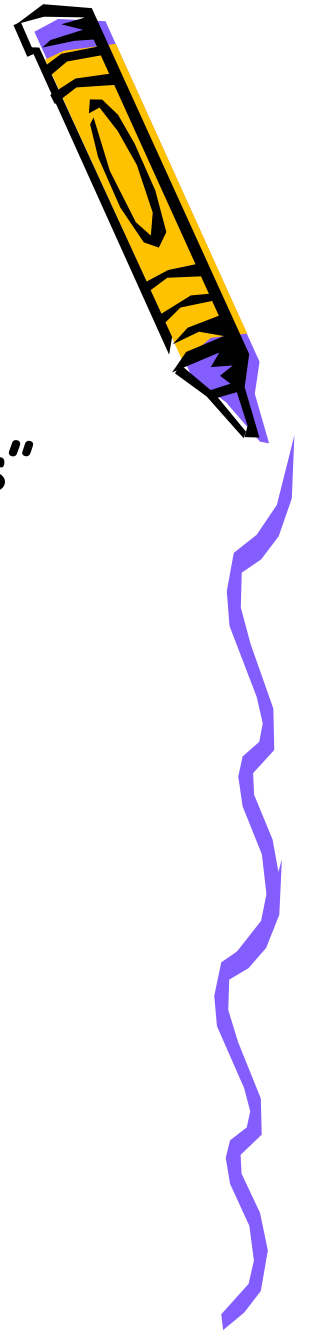
- 32-step plan to ease the child into tolerating, interacting, smelling, touching, tasting, and eating a new food.

<http://www.spdparentzone.org/>



Other Resources...

- "Child of Mine"
 - *E. Satter*
- "Just Take a Bite" and "Finicky Eaters"
 - *L. Ernsperger and T. Stegen-Hanson*
- "Changing the Course of Autism"
 - *B. Jepson*
- "Special-Needs Kids Eat Right"
 - *J. Converse*
- "What's Eating Your Child"
 - *K. Dorfman*
- "Just Two More Bites!"
 - *L. Piette*
- "Poor Eaters"
 - *J. Macht*



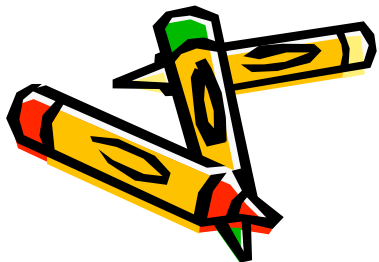
IFSP/IEP - Feeding Problem

**** Do you have outcomes or goals for your students with feeding issues**

Example

Goal:

Child will master the basic life skill of independently eating a variety of age appropriate nutritious foods.



Summary

- Eating is one of the most important and complex skills acquired in early childhood.
- Children with ASD typically have problems with feeding.
- Feeding problems may lead to malnutrition negatively impacting brain and body function.
- A multi-disciplinary approach to assessing and treating the feeding problem is critical.
- The feeding treatment methods should be individualized for each child.

